

Forging the Innovation Generation

An Introduction for Schools

- **Engineering**
 - Middle School: Gateway To Technology
 - High School: Pathway To Engineering
- **Biomedical Sciences**

“ In little more than a decade, the PLTW network has expanded across all 50 states and the District of Columbia. ”



Dear Colleague,

Project Lead The Way® (PLTW) began as a school improvement initiative designed to address the shortage of engineers in the United States. The basic concept was simple—combine a rigorous and relevant curriculum with project-based and problem-based instruction. Yet, as it turns out, the impact of this simple idea was far-reaching and phenomenal.

After little more than a decade, the PLTW network had expanded across all 50 states and the District of Columbia to almost 3,000 schools. Why? Because the PLTW approach works, not just for engineering, but as a transformational catalyst for education improvement in any discipline for any school. Research shows that PLTW students are more likely than their peers to pursue science, technology, engineering, and mathematics (STEM) majors at the postsecondary level, to succeed in those challenging programs, and to enter a STEM-related field after graduation.

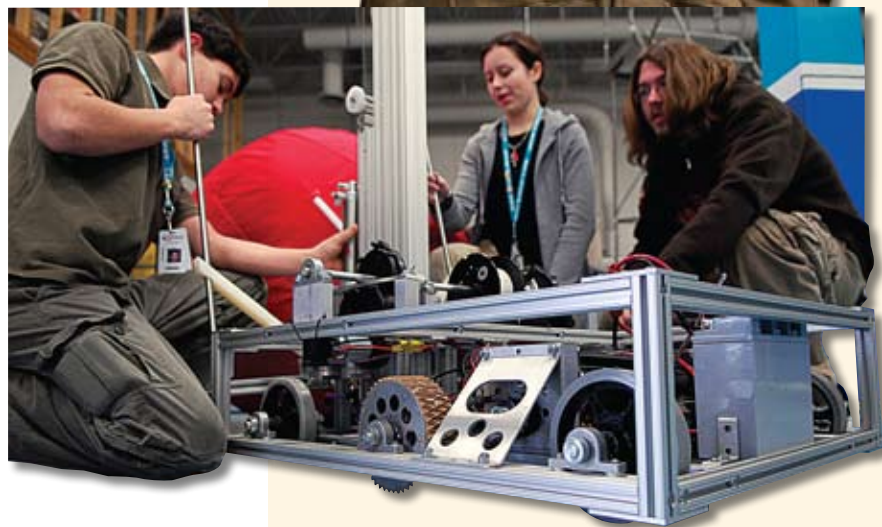
Although these results are impressive, they are only a starting point in PLTW's quest to help meet the demand for qualified STEM professionals, provide a world-class STEM education to every student in the United States, and help *all* students succeed. We at PLTW are committed to helping reshape STEM education—but we can't do it alone.

The PLTW network is built on exceptional partnerships—individuals, businesses, and organizations coming together to help students. Fulfillment of our ambitious mission of transforming STEM education requires additional partners who share PLTW's commitment to excellence and evaluation, and who understand the national importance of forging the Innovation Generation—the next group of American graduates equipped to succeed and lead in the increasingly competitive high-tech, high-skill global economy.

This guide, *Forging the Innovation Generation*, provides an overview of PLTW's approach, curriculum, achievements, and partnerships. Please take the time to explore what PLTW has to offer, and please contact us with any questions or to get involved with our initiatives. We're proud of what PLTW has accomplished, but this is only the beginning. Please join us in the effort to inspire and strengthen America's Innovation Generation.

Richard Blais

Richard Blais
Vice President, Project Lead The Way



Photos, from top of page: **David Schaeffer** (center) of Rhodes State Community College, works with **Ashley Kohls** (left) and **Amanda Schnipke** on a digital trainer at Miller City High School in Miller City, Ohio.

Middle: **Sam Patel** is a student in the Principles of Engineering class at Liberty High School in Liberty, Missouri.

Bottom: **Lucas Zahn** (left), **Danielle Shada**, and **David Schmidt** work on a project in their robotics class at LakeView Technology Academy in Kenosha, Wisconsin.

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PLTW: Leading the Effort to Improve STEM Education

MEETING THE STEM CHALLENGE

Technical innovation has long been the driving force of the United States' economic prosperity.

For decades, academic excellence in the nation's science, technology, engineering, and mathematics (STEM) classrooms has helped the United States compete, succeed, and remain economically and militarily secure.

In recent years, however, the STEM fuel that traditionally powered United States ingenuity has been in ever-shorter supply. The 2007 landmark report *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*, prepared by the National Academy of Engineering, the National Academy of Sciences, and the Institute of Medicine, stated, "the scientific and technical building blocks of America's economic leadership are eroding." If we are to reestablish the United States as a global leader, the report concluded, we must advance STEM education by improving K–12 science and math coursework, strengthening the skills of STEM teachers, and expanding the pool of students prepared for rigorous college-level STEM programs.

A 2007 National Science Board study sounded the same alarm, reporting that "within the current education system, U.S. students are not obtaining the STEM knowledge they need to succeed." The report outlined two main challenges for the nation's STEM education system: ensuring coherence throughout the system, and ensuring an adequate supply of well-prepared, effective STEM teachers.

Achieving the ambitious goals outlined in both reports requires a national effort to improve STEM education. In 2007, Project Lead The Way® (PLTW) pledged to lead this effort by expanding its proven engineering-focused model into areas such as biomedical sciences to help develop the nation's next wave of talented scientists, technologists, and mathematicians—a group we call the Innovation Generation. PLTW's STEM initiative is supported by four Pillars of Excellence:

- Sustainability
- World-class Curriculum
- Professional Development
- Partnerships

Meeting the nation's STEM challenge is a natural fit for PLTW. Identified in the *Rising Above the Gathering Storm* report as a model for "K–12 curriculum materials based on world-class standards," the project-based/problem-based approach and rigorous and relevant curriculum have made PLTW an effective catalyst for education improvement at any school.

Since 1997, PLTW has been preparing students for success in math, science, engineering, and technical careers. At the beginning of the 2008–09 school year, there will be almost 3,000 PLTW schools in all 50 states and the District of Columbia, enrolling 250,000 students.

With classic American ingenuity, PLTW created a STEM model that works for any school. Partnering in the PLTW effort helps ensure that every student has access to that world-class STEM education required to compete in the global marketplace. Read on to learn more about how PLTW works and how you can join this ambitious effort to reshape STEM education in the United States.

Team mechanic **Joseph Tatum** (left) and project manager **Scott Varvel** work on their robot, Atlas, which is designed to move omnidirectionally and lift a large ball. They are students in the Principles of Engineering class at Liberty Junior High School in Liberty, Missouri.



Student **Bradley Kennedy** (left) works with architect **Brad Brown** on the design of a wood structure for a Destination Imagination competition at Wando High School in Mt. Pleasant, South Carolina.



WHY PLTW WORKS FOR STEM

PLTW'S rigorous curriculum makes science, technology, engineering, and mathematics (STEM) relevant for students. By engaging in hands-on, real-world projects, students begin to understand how the skills they are learning in the classroom can be applied in everyday life.

All the PLTW middle and high school courses:

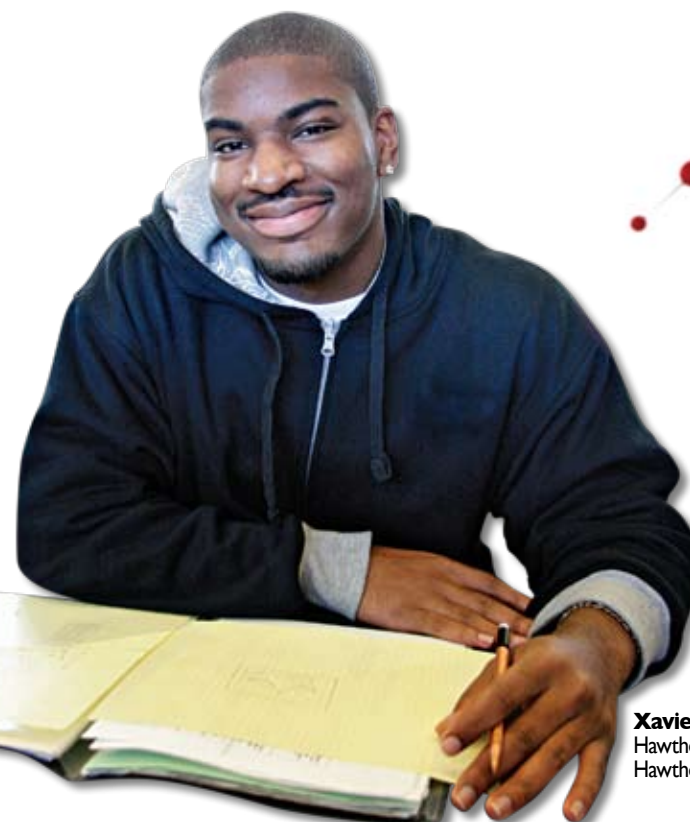
- Meet national standards for mathematics, science, technology education, and English language arts.
- Offer a complete career/technical concentration with an emphasis on both mathematics and science.
- Link demanding mathematics and science courses with top-quality academic and technical courses.
- Provide a project- and problem-based context for the application of math and science concepts.

Abstract Molecular Model
©2008 iStockPhoto.com / Mark Evans

"I've learned that I am a team player. But you also have to be self-reliant. I've gained a lot of confidence from this program."

—XAVIER COOLEY

Hawthorne High School, Hawthorne, California



Xavier Cooley,
Hawthorne High School,
Hawthorne, California



Fast Fact: A National Association of Manufacturers report, compiled in conjunction with Deloitte Consulting, predicts that manufacturers will need as many as 10 million new skilled workers by 2020.

Assessment & Results

MEETING THE STEM CHALLENGE

The ultimate measure of how well Project Lead The Way® (PLTW) works is actual student performance. PLTW's goal is to make sure that all of its students are ready for the rigor of any postsecondary experience. Achieving this standard requires continuous assessment to evaluate program effectiveness.

To ensure that PLTW is delivering on the promises made to its partners, schools, students, and host communities, the network works closely with states and educational institutions to collect and analyze appropriate data. This data is used to inform quality initiatives and continuous improvement efforts.

Two recent reports give PLTW high marks in fulfilling its mission "to prepare an increasingly numerous and more diverse group of students to be successful in science, engineering, and engineering technology." Both the 2006–07 TrueOutcomes PLTW assessment (conducted by Cengage Learning) and the Southern Regional Education Board (SREB) analysis of the 2006 High Schools That Work assessment reported increasing numbers of students completing PLTW's engineering and technology courses in high school, higher GPAs among PLTW students, and more PLTW students choosing a STEM-related major in college.

Complete TrueOutcomes and High Schools That Work assessment results are available for review and download at www.pltw.org.



Daeon Womac studies at Introduction to Engineering Design at Hawthorne High School in Hawthorne, California.

Highlights from TRUEOUTCOMES 2006–07



- At the end of the 2006–07 school year, 60 percent of PLTW high school students indicated an intention to major in engineering and technology in college.
- A full 90 percent of PLTW high school seniors want jobs that emphasize engineering, technology, or computer science.
- PLTW alumni are retained in engineering and related STEM majors at a rate of 90 percent or greater.
- PLTW alumni achieve a higher GPA than their peers in their freshman year of study (.2 greater).

Highlights from the High Schools That Work Assessment Analysis



- In 2006, PLTW students scored much higher in both mathematics and science than other career and technical education (CTE) students.
- PLTW's challenging and well-taught curriculum resulted in better student performance.
- PLTW students were 23 percent more likely than other career and technical students to have completed four years of mathematics.
- PLTW students were 25 percent more likely than other career and technical students to complete at least three years of science courses taught at a college preparatory level.

PLTW AT A GLANCE As of Fall 2008

STATES WITH PLTW PROGRAMS:
50 states and the District of Columbia

TOTAL SCHOOLS: **3,000**

TOTAL TEACHERS TRAINED: **7,000**

TOTAL COUNSELORS TRAINED: **5,000**

TOTAL STUDENTS ENROLLED IN PLTW CLASSES: **250,000**

TOTAL NUMBER OF STUDENTS WHO HAVE EXPERIENCED PLTW:
More than 500,000 have taken at least one PLTW course

Student **Abbie Ramboa** of Lancaster High School in Lancaster, California, takes a field trip to a flight museum with her PLTW class.



THE COLLEGE CONNECTION

Preliminary analysis of PLTW alumni college transcripts suggests that students pursue engineering and technology at a rate that is five times the national average for typical first-year students, and that they are very successful in college—achieving a GPA of 3.0 or above, with average grades of B or better in calculus, physics, and chemistry.
(Source: TrueOutcomes 2006–07)

Students **Taber Stockstill** (top) and **Shelby James** at the Francis Tuttle Biosciences and Medicine Academy in Oklahoma City, Oklahoma.



Middle School Program: Gateway To Technology (GTT)

HOW PLTW WORKS



Gateway To Technology™ (GTT) is an activity-oriented program designed to challenge and engage the natural curiosity of middle school students, and is taught in conjunction with a rigorous academic curriculum.

The program is divided into five independent, nine-week units. Schools can choose to spread the GTT units through grades six through eight, or teach most units in the seventh or eighth grade. Each unit contains performance objectives and suggested assessment methods.

Siva Shankar is a Gateway To Technology student at Kenosha, Wisconsin's Kenosha School of Technology Enhanced Curriculum.

GTT UNITS OF STUDY

- **Design and Modeling** introduces students to the design process. Using design briefs, students create models and documentation to solve problems.
- **The Magic of Electrons** gives students the opportunity to explore the science of electricity, the movement of atoms, circuit design, and sensing devices.
- **The Science of Technology** teaches students about the mechanics of motion, the conversion of energy, and energy transfer.
- **Automation and Robotics** explores the history and development of automation and robotics while teaching students about structures, energy transfer, machine automation, and computer control systems.
- **Flight and Space**, which was developed with NASA, introduces students to the technology of aeronautics, propulsion, and rocketry.



Above: **Devante Griffin** and **Kathryn Kritzman**, GTT students at Jefferson/Whittier Middle School in Pontiac, Michigan.

“ I knew the Gateway To Technology curriculum would make connections between the real world and what the students are learning in math and science. ”

—**BARBARA KUBINSKI**, PLTW MASTER TEACHER
NICHOLS JUNIOR HIGH SCHOOL, ARLINGTON, TEXAS



Temetria Higgins (for left) and **Tiffany Krumm** of Jefferson/Whittier Middle School in Pontiac, Michigan, work on a Magic of Electrons project.

Below: **Ashley Davis** (left) and **Amber Briggs** work on their plane at a Gateway Academy camp in Pontiac, Michigan.



PUMP UP THE RIGOR

For maximum impact on student achievement, the GTT curriculum should be combined with a challenging academic curriculum in which reading instruction is included in the academic core curriculum through grade eight. In addition, the curriculum should empower students to:

- Complete Algebra I successfully or pass a pre-algebra proficiency test and use algebra concepts to reason and solve problems.
- Use laboratory and technology experiences to learn scientific concepts in physical, life, and earth/space sciences.
- Use language correctly and effectively to find, organize, and report information through reading, writing, speaking, and listening.
- Describe their heritage, their government, their world, and economic principles through the study of key issues of the past, present, and future.

ACKNOWLEDGING EXCELLENCE

Because of the rapid growth and success of PLTW's middle school component, the organization has introduced the Gateway To Technology School of Excellence program. This national program recognizes the achievement of students and teachers in middle schools in the PLTW network and calls the community's and nation's attention to the vital role middle schools play in motivating students to reach excellence. For more information, go to www.pltw.org.



Particle stream of reflective spheres.
©2008 iStockPhoto.com / Alwyn Cooper

High School Curriculum: Pathway To Engineering

HOW PLTW WORKS



The Project Lead The Way® (PLTW) Pathway To Engineering™ curriculum is designed as a four-year high school sequence that will fit into any student schedule, and is taught in conjunction with traditional math and science courses. The program is divided into eight rigorous, relevant, reality-based courses.



From left: **Bradley Kennedy**, **Kevin Carlson**, and **Matt Davidson** set up a stress analyzer to load-test their wooden structure for a Destination Imagination competition at Wando High School in Mt. Pleasant, South Carolina.



FOUNDATION COURSES

- **Introduction to Engineering Design** (IED) allows students to use sophisticated three-dimensional modeling software to improve existing products, invent new ones, and communicate the details of the products to others.
- **Principles Of Engineering** (POE) uses student activities, projects, and problems to explore the wide variety of careers in engineering and technology and examine various technology systems and manufacturing processes.
- **Digital Electronics** (DE) uses computer simulations to teach students about the logic of electronics as they design, test, and construct circuits and devices.

SPECIALIZATION COURSES

- **Aerospace Engineering** (AE) uses hands-on engineering projects and problems to teach students about aerodynamics, astronautics, space-life sciences, and systems engineering.
- **Biotechnical Engineering** (BE) employs relevant projects from biotechnology, bioengineering, biomedical engineering, and biomolecular engineering to teach students to apply and develop secondary-level knowledge and skills in biology, physics, technology, and mathematics.
- **Civil Engineering and Architecture** (CEA) provides an overview of the fields of civil engineering and architecture, via relevant activities, projects, and problems emphasizing the interrelationship of the two fields.
- **Computer Integrated Manufacturing** (CIM) gives students the opportunity to employ automation, control systems, sensing devices, computer programming, and robotics to efficiently mass-produce a product using a three-dimensional model.

CAPSTONE COURSE

- **Engineering Design and Development** (EDD) gives students the opportunity to work in teams to solve problems of their own choosing. Under the guidance of a community mentor, teams employ all the skills and knowledge gained through previous coursework to brainstorm, research, construct, and test a model in real-life situations (or simulations); document their designs; and present and defend the designs to a panel of experts.



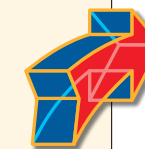
PLTW freshman students **Reed Smarrelli** and **Becky Bodine** discuss a class project at East Lake High School in Tarpon Springs, Florida.



“There are a lot of students who think they want to be engineers. PLTW gives students real insight into what engineering and engineering-related careers entail.”

—DENNIS JOHNSON, PRINCIPAL
MORTON HIGH SCHOOL, MORTON, ILLINOIS

EARNING COLLEGE CREDIT



Students in national affiliate/PLTW-certified high schools who have excelled in selected PLTW courses receive on their transcript college credit for Introduction to Engineering Design, Principles Of Engineering, Digital Electronics, Computer Integrated Manufacturing, Biotechnical Engineering, Aerospace Engineering, and Civil Engineering and Architecture. Not all national affiliates offer credit for each course.

Although these institutions vary somewhat in their requirements for awarding credit to students, generally the requirements include a B average in the PLTW course and a grade of 85 percent or higher on the PLTW college credit examination administered at the student's school. A summary of each affiliate's requirements appears on the Parents/Students page of the PLTW website at www.pltw.org.



At Wando High School in Mt. Pleasant, South Carolina, **Dilly Hughes** constructs an architectural model for a Destination Imagination competition.

High School Curriculum: Biomedical Sciences

HOW PLTW WORKS

The Project Lead The Way® (PLTW) High School Biomedical Sciences Program engages students in rigorous and relevant hands-on problems related to the human body, cell biology, genetics, disease, and other biomedical science topics.

There are no prerequisites to enter the program. It is a sequence of four courses, each building on the previous one and all aligned with appropriate national learning standards.

FOUNDATION COURSES

- **Principles of the Biomedical Sciences™** introduces students to the program and builds the scientific foundation for success in subsequent courses through hands-on projects and problems involving the study of human medicine, research processes, and bioinformatics.
- **Human Body Systems™** explores basic human physiology, especially as it relates to human health. Students use a variety of monitors to examine body systems, and design and build systems to monitor body functions.
- **Medical Interventions™** uses student projects to investigate various medical interventions that extend and improve quality of life, including gene therapy, pharmacology, surgery, prosthetics, rehabilitation, and supportive care.



Kelly McNabb, a senior at Greenfield-Central High School in Greenfield, Indiana, works in the Biomedical Sciences lab.

CAPSTONE COURSE

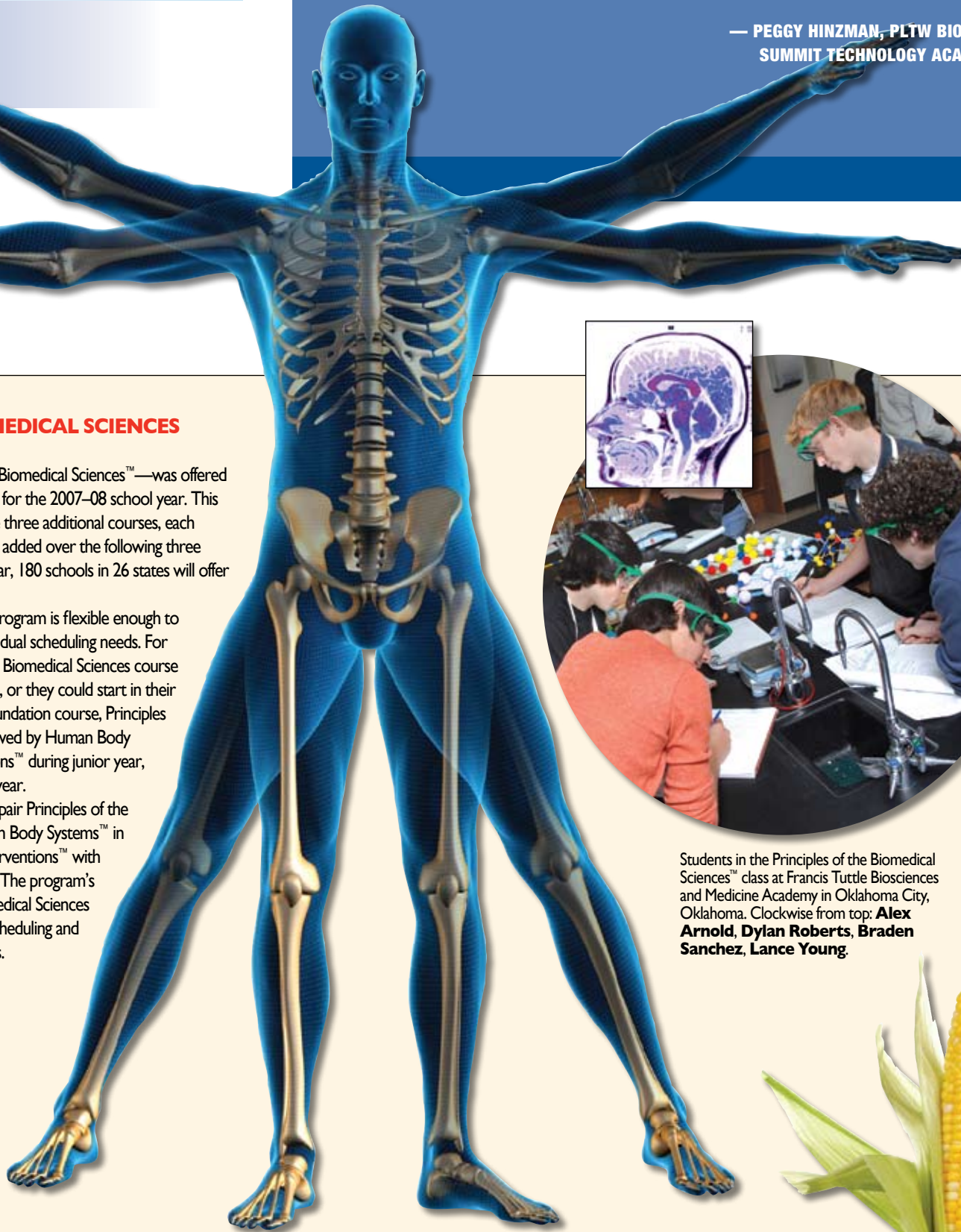
Science Research™ gives student teams the opportunity to work with a mentor, identify a scientific research topic, conduct research, write a scientific paper, and defend team conclusions and recommendations to a panel of outside reviewers. This course may be combined with the capstone course from the engineering pathway (*see page 8*), allowing students from both pathways to work together to engineer a product that could have an impact on health care.

THE FUTURE OF BIOMEDICAL SCIENCES

The first course—Principles of Biomedical Sciences™—was offered in seven states and 42 schools for the 2007–08 school year. This course lays the foundation for the three additional courses, each building on the earlier ones, to be added over the following three years. For the 2008–09 school year, 180 schools in 26 states will offer a Biomedical Sciences course.

PLTW's Biomedical Sciences Program is flexible enough to meet a school's or student's individual scheduling needs. For example, students could take one Biomedical Sciences course each year beginning in ninth grade, or they could start in their sophomore year with the first foundation course, Principles of the Biomedical Sciences™, followed by Human Body Systems™ and Medical Interventions™ during junior year, and Science Research™ in senior year.

Other schools may choose to pair Principles of the Biomedical Sciences™ with Human Body Systems™ in 11th grade, and offer Medical Interventions™ with Science Research™ in 12th grade. The program's flexibility makes the PLTW Biomedical Sciences curriculum ideal for both block scheduling and traditional seven-period schedules.



“ I am so excited to teach a Biomedical Sciences curriculum that makes problems, projects, and activities the cornerstone of what you do in the classroom. **”**

— PEGGY HINZMAN, PLTW BIOMEDICAL SCIENCES INSTRUCTOR
SUMMIT TECHNOLOGY ACADEMY, LEE'S SUMMIT, MISSOURI

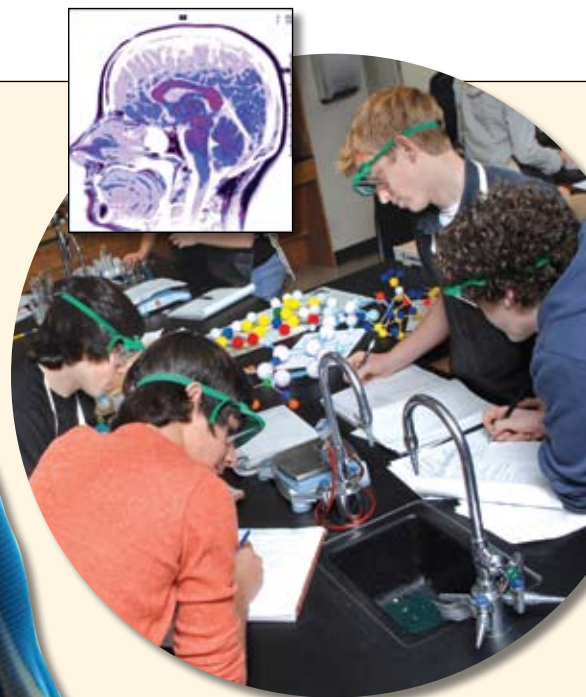


Following the PLTW Model: Agricultural Education

The National Council for Agricultural Education (www.teamaged.org) is adapting PLTW's project-based curriculum model to reinvent agricultural education in the United States.

“Nearly one in five Americans, or about 17 percent of the U.S. workforce, is employed in some aspect of agriculture, yet we only have approximately 7,200 agricultural education programs nationwide,” says council member and National FFA Chief Operating Officer Doug Loudenslager. “We see partnering with PLTW as an opportunity for us to build a comparable model in the agricultural sciences, which would increase the rigor and relevance of agricultural education and allow us to significantly increase the number of students involved. For our students and for U.S. agriculture to remain competitive in the world, ag ed needs to be held up to the same standards as other academic subjects being taught in our schools today.”

PLTW will consult throughout the process of building a framework for a national core curriculum in agriculture, food sciences, and natural resources. Two foundation courses—one in plant sciences and one in animal sciences—are currently being developed. The council plans to begin work on a series of five advanced courses once the foundation classes are completed.



Students in the Principles of the Biomedical Sciences™ class at Francis Tuttle Biosciences and Medicine Academy in Oklahoma City, Oklahoma. Clockwise from top: **Alex Arnold, Dylan Roberts, Braden Sanchez, Lance Young.**



Christy Niese (left) and **Andi Lambert** solve a problem in their Principles of the Biomedical Sciences™ class at Miller City High School in Miller City, Ohio.



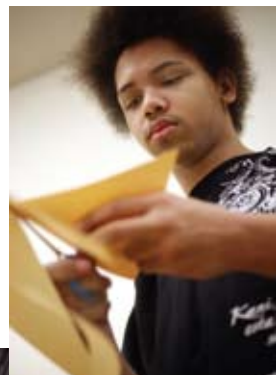
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A Portrait Gallery

INSIDE THE INNOVATION GENERATION



Robert Ellis builds a model windmill, part of a PLTW course at Thornton Township High School in Thornton, Illinois.



Bryan Castillo looks through the microscope during his Biomedical Sciences class at Fort Mill High School in Fort Mill, South Carolina.



PLTW student **Liliana Garcia-Rios** works on a computer at Thornton Township High School in Thornton, Illinois.

From middle school and high school; from big cities, small towns, and rural communities; from every region of the country—each of these students comes from somewhere different, yet all are united in their sense of purpose. Armed with the STEM skills and thirst for knowledge that PLTW develops, they're moving forward to become the Innovation Generation.



Grassy Reynolds, working in the Biomedical Sciences lab at Greenfield-Central High School in Greenfield, Indiana.



In Fishers, Indiana, Hamilton Southeastern High School students **Loor Alshawa** (left) and **Chris Pendergraft** work with a model of water molecules.



Student **Trevor Londergan** takes Introduction to Engineering Design at Lancaster High School in Lancaster, California.



Above: Seventh grader **Angela Stoebe** helps kindergartner **Abby Luellen** with a GTT project at Kenosha School of Enhanced Technology Curriculum in Kenosha, Wisconsin.



Prospective students **Courtney Merz** (left) and **Kylee Caesar** at an open house for the Pre-Engineering Academy at Francis Tuttle Technology Center in Oklahoma City, Oklahoma.

PLTW Profiles

INSIDE THE INNOVATION GENERATION



At left: **Jalesa Gaines** in the lab at the Francis Tuttle Biosciences and Medicine Academy in Oklahoma City, Oklahoma.

Building, growing, and sustaining a successful business begins with people. But without a steady supply of highly skilled, homegrown talent, employers in many states are forced to recruit out-of-state and around the globe to fill positions in key STEM-related industries, including engineering, biotechnical and biomedical sciences, and advanced manufacturing.

Through its rigorous and relevant curriculum and project-based approach, Project Lead The Way® (PLTW) is helping local communities develop a homegrown talent pool of professionals equipped to succeed in high-tech, high-skill careers. The members of this Innovation Generation are highly motivated PLTW students who have experience working in teams to solve complex problems, making them valuable employees in any business.

MOLLY HAWTHORNE 1999 PLTW graduate Project Manager, Saint-Gobain Performance Plastics Poestenkill, New York

While a student at Colonie Central High School in Albany, New York, Molly Hawthorne enrolled in the PLTW Principles of Engineering course. Through the class, she met several practicing engineers, one of whom recruited her to attend Clarkson University.

Hawthorne, who earned her bachelor of science degree in interdisciplinary engineering and management from Clarkson in only three years, credits PLTW for introducing her to engineering, preparing her for a college engineering program, and helping her launch a successful career in engineering.

While at Clarkson, Hawthorne was on the dean's list and named a presidential scholar. She spent her fourth year completing her MBA with a concentration in innovations and new venture management.

Currently, Hawthorne is a project manager at Saint-Gobain Performance Plastics in Poestenkill, New York. She has global responsibility for high-performance fluoropolymer consumables used in laboratories and high-performance closures used in chromatography and environmental testing. Her responsibilities include product development, business development, marketing, and strategic planning.



Molly Hawthorne

Whitney Montgomery and **Nathan Doughit** work on a Digital Electronics project at Del Rio High School in Del Rio, Texas.



“Our school had never had a program like this, and I just really wanted to be a part of it.”

WHITNEY MONTGOMERY
Del Rio High School, Del Rio, Texas

In addition, PLTW students have access to the latest computer software and equipment used by industry, so they are well-equipped to handle any new technologies. Finally, PLTW students regularly make detailed presentations in class, at conferences, and in competitions, which helps them develop excellent communication skills.

Take a moment to meet a few members of the PLTW Innovation Generation. There are 250,000 more like them in the United States today, and as the PLTW network grows, so will our nation's ability to compete and win in the high-tech global marketplace.



For the latest news about members of PLTW's Innovation Generation, visit the PLTW website, www.pltw.org.

BRIANNA O'DELL 2007 PLTW graduate Packaging Sciences major, Rochester Institute of Technology Rochester, New York

In her freshman season on the women's basketball team at Rochester Institute of Technology (RIT), Brianna O'Dell started every game and was a leading scorer. Yet it wasn't hoops that drew O'Dell to RIT. “That decision,” she says, “was all about engineering.”

For O'Dell, engineering, in turn, is all about imagination.

Now a Packaging Sciences major in her sophomore year, O'Dell says, “Before I started taking PLTW classes in high school, I had no idea engineering would appeal to me. Then my mom told me about some technical courses where I would get to use my imagination.”

As a member of her high school's Student Ambassador team, O'Dell once found herself the only teenager in a room full of educators, there for what was supposed to be a group demonstration of PLTW's Digital Electronics course. O'Dell showed them how to create a simple circuit and explained the merits of the program. “The teachers loved it,” she recalls.

That 20-on-one experience—and all her hard work combining engineering with athletics—have only built O'Dell's confidence. As a collegiate member of the National Society of Black Engineers, O'Dell is active in outreach to those whose footing might be less sure. “There are a lot of students at our college who don't get the help they need,” she says. “Our annual conference has a big engineering career fair showcasing a bunch of engineering jobs. That can give you a lot of ideas.”

At this point in her life, no one specific engineering field has seized O'Dell's imagination, and the task ahead in basketball remains “to improve one step at a time.” But knowing that engineering is the work she wants to do helps O'Dell keep all her goals in sight. “Academics,” she says, “come first.”



Brianna O'Dell

JUSTIN PERRY and RYAN BROSNAHAN 2007 PLTW graduates Akron Firestone High School Akron, Ohio

During the summer of their junior year at Firestone High School in Akron, Ohio, Justin Perry and Ryan Brosnahan served as PLTW student interns for a University of Akron professor. The pair's assignment was to research biodiesel fuel, and their efforts were so successful that the results were published in the October 2007 edition of the juried scientific publication *Biotechnology and Applied Biochemistry*.

The PLTW graduates wrote the first draft of the article and are listed as coauthors in the publication. Currently, Perry is studying chemical engineering at Carnegie Mellon University in Pittsburgh and Brosnahan is studying polymer science at the University of Akron.



Justin Perry



Ryan Brosnahan

Partnering for Success with PLTW

PLTW PARTNERS

The Project Lead The Way® (PLTW) concept became an actual program thanks to partners. It is through the continuing support, direction, and resources of its exceptional partners that PLTW is able to fulfill its mission each day in United States classrooms.

Since the organization's launch in 1997, PLTW has recognized the essential role that partnerships play. Today, these partnerships are more diverse than ever as PLTW reaches out to a wide variety of groups to realize its vision of helping reshape STEM education.

"Everything we do is based on partnerships," says Niel Tebbano, PLTW vice president. "The ultimate goal here is solving the nation's 21st-century technical and scientific workforce issue. Our partners recognize that if they are going to have the workforce and markets they need for future success, then they need to invest human and financial resources in STEM."

PLTW's partners help the network grow and keep pace with ever-changing technology. Countless local partners provide technical support, materials, funding, and other resources to individual schools and districts.

Other groups and companies partner with PLTW on a regional or national scale.

"So many companies and business professionals are engaged with PLTW in an altruistic and selfless manner," says Richard Blais, PLTW vice president. "Selfless support from exceptional partners is what distinguishes PLTW."

The list of partners on pages 17–21 demonstrates the scope and diversity of the PLTW network. For information on additional PLTW partners and how your company or organization can get involved, visit www.pltw.org.



Students **Shyette Edwards** (standing) and **Chaquita Thompson** work on projects at Thornton Township High School in Harvey, Illinois.



Hilary James (far left) and **Kangwa Mundende** with teacher **Jennie Croslin** (center) at Francis Tuttle Biosciences and Medicine Academy in Oklahoma City, Oklahoma.



Christina Maxwell, a student at Francis Tuttle Biosciences and Medicine Academy in Oklahoma City, Oklahoma, plans to go on to medical school.

BUSINESS PARTNERS

Autodesk

This international design technology company was the original PLTW corporate partner. In 1999, Autodesk generously supported PLTW by providing fundamental software packages for PLTW courses. Since that time, Autodesk has increased its support for PLTW by making its highly advanced digital prototyping solutions available through substantial discounts, subscriptions, grant programs, training curriculum development, and community resources.

These resources include the Autodesk Student Engineering and Design Community for middle and high schools. This free social networking website for students in the fields of architecture, construction, civil engineering, and mechanical engineering provides access to free product downloads and learning tools. For example, students can download free student editions of Autodesk software, find jobs, discuss projects, share work, learn from experts, and communicate with other students, teachers, and industry professionals who use Autodesk. Through the Autodesk Design Academy, PLTW schools can obtain licenses for the same cutting-edge 3D design tools used by professionals around the world. • www.autodesk.com

Autodesk

Stratasys/Dimension

A generous grant program sponsored by Dimension, a business unit of Stratasys, is helping bring PLTW students' designs to life. Through the program, as many as 20 PLTW network schools have been able to purchase state-of-the-art Dimension BST 768 3D printers—an opportunity that otherwise might have remained out of reach.

Dimension worked with PLTW's regional directors to identify outstanding schools that would benefit from the \$10,000 grants. The nominated schools applied for a grant to be used toward the purchase of a three-year comprehensive Dimension printer package valued at more than \$32,000 yet priced at only \$16,500.

The grant program fit the shared mission of Dimension 3D printers and PLTW: to foster student interest in engineering. With access to the state-of-the-art 3D printers, PLTW students at the selected schools can build physical, ABS-plastic models of their designs that they can test for form, fit, and function. • www.stratasys.com

STRATASYS

dimension

Fischertechnik

PLTW offers Fischertechnik educational kits to schools and students at substantially reduced prices. Germany-based Fischertechnik's building system components are used by engineers around the world to model real-world machines and structures down to the last detail. The basic building block is uniquely designed and can be connected on all six sides, enabling an infinite variety of combinations. Assembled models stay together without glue or soldering but can easily be reconfigured. • www.fischertechnik.com

fischertechnik

Cengage Learning

In 2007, Cengage Learning, formerly Thomson Learning, acquired TrueOutcomes, LLC, the web-based provider of universal assessment tools, which conducts the annual assessment of PLTW's programs. Cengage provides PLTW ready access to data that demonstrates how—and how well—student learning objectives and desired outcomes are being met at the course, program, and network level. As PLTW continues to grow in size and visibility, the partnership with Cengage will become increasingly essential. Through the Cengage TrueOutcomes assessment, PLTW is able to collect significant data with which to measure and assess the success of PLTW students as compared to non-PLTW students.

PLTW and Cengage are also partnering to produce a series of high school and middle school textbooks aligned with the PLTW curriculum. The first edition debuted in 2007. • www.cengage.com

CENGAGE Learning

Edgecam

Edgecam's partnership with PLTW began in spring 2004 with the introduction of Edgecam software to the Computer Integrated Manufacturing (CIM) course for high school students. Edgecam, considered the most advanced solids-based machining system currently available, allows PLTW students to mill out designs on a computer numerical control (CNC) machine that they have drawn on Autodesk Inventor. The Edgecam software is ideal for pre-engineering students because it is easy to use and is the best-integrated computer-aided manufacturing (CAM) software for working with Autodesk Inventor. Using Edgecam gives PLTW students real-world experience in the field of manufacturing engineering. • www.edgecam.com

edgeCAM intelligent manufacturing

BUSINESS PARTNERS (continued)



Intelitek
Intelitek’s computer numerical control (CNC) machines and robots have been used in PLTW’s Computer Integrated Manufacturing (CIM) course since the curriculum launched in 1996. Intelitek contributed to the development of the PLTW CIM curriculum, as well as trained the PLTW master teachers during the beginning phases of the project, and is a charter member of the PLTW development team and the oldest supplier to the network. • www.intelitek.com

National Instruments
Texas-based National Instruments (NI) supplies a variety of state-of-the-art software for PLTW students, as well as training to support new and existing PLTW programs. Tools integrated into the curriculum as part of the PLTW–NI collaboration include Multisim, software used for schematic simulation of electrical circuits; the LabVIEW graphical system design software and the Data Acquisition board used in the Biomedical Sciences Program and the Pathway To Engineering high school Engineering Design and Development course; and a field-programmable gate array (FPGA) board currently being designed for use in the Digital Electronics course.
The latest PLTW–NI project is the introduction of LabVIEW into the sequence of PLTW’s four new high school Biomedical Sciences courses. Students will learn concepts through project-based curricula using LabVIEW software; Vernier SensorDAQ hardware, developed jointly by Vernier Technologies and NI; and additional Vernier sensors. The ease of use offered by LabVIEW and the simple USB-based data acquisition interface in Vernier SensorDAQ will allow students to design, analyze, and control sensor-based systems such as devices used for measuring blood pressure and electrical activity of the heart. • www.ni.com

SPONSORSHIPS

Northrop Grumman
Through generous grants from the global defense company’s foundation, three PLTW public schools in San Diego’s Poway Unified School District and two in Gloucester, Virginia, have been paired with Northrop Grumman engineer mentors. In the future, the company plans to expand the program to other regions where Northrop Grumman plant sites are located.
At each partner school, a Northrop Grumman engineer is paired with a PLTW teacher, serving as a mentor for teachers and guiding students through real-life applications of lessons learned in the classroom each week. The engineers share their knowledge and industry experience to reinforce specific course assignments, and support the program outside the classroom through presentations to interested parents and community groups. • www.northropgrumman.com

Intel
Since 2001, the Fortune 100 corporation has worked to bring PLTW to more students nationwide. Intel offers cash grants and computer donations to PLTW schools, provides internships and job shadowing opportunities to students, and participates in special events designed to promote awareness of engineering and technology careers. • www.intel.com

Lockheed Martin
Lockheed Martin, which commits 50 percent of its philanthropic contributions, outreach initiatives, and volunteer hours to education, generously supports PLTW through a number of programs. The global aerospace firm supports 10 PLTW high schools in Lockheed Martin plant communities through matching grants, through mini-grants, and by providing engineer mentors and community relations personnel for each school’s PLTW partnership team through its innovative “Engineers in the Classroom” initiative. The company’s goal is to support 75 PLTW schools—new and existing—within five years, provide scholarships to PLTW graduates entering engineering majors, and provide content support and funding for the revision of PLTW’s aerospace curriculum.
Through “Engineers in the Classroom,” Lockheed Martin works with PLTW schools, or those that will implement the PLTW curriculum, in communities near the corporation’s major business locations. In these schools, Lockheed Martin supplements the PLTW curriculum by supporting hands-on extracurricular activities, which encourage teamwork and illustrate the engineering principles learned in the classroom.
Lockheed Martin engineers help students connect what they are learning in the classroom to real-world careers and projects by guest lecturing in the classroom, coaching extracurricular teams, and serving as role models and mentors. In addition, the engineers serve as advisors and additional expert resources for teachers. • www.lockheedmartin.com

SPONSORSHIPS (continued)



Rockwell Automation
This Fortune 500 company, headquartered in Milwaukee, funds several PLTW schools in Milwaukee and Cleveland, provides mentors for PLTW classrooms, and hosts special events for area PLTW schools. Rockwell Automation is committed to increasing minority student participation in engineering. • www.rockwellautomation.com



Rolls-Royce
Rolls-Royce of Indianapolis provides 10-week, paid summer internships to PLTW teachers. The programs offer educators real-world engineering experience to share with their students. During the internship, selected teachers work on projects aligning with the PLTW curriculum. Rolls-Royce also provides funding to each teacher-intern’s school to support the engineering program. • www.rolls-royce.com

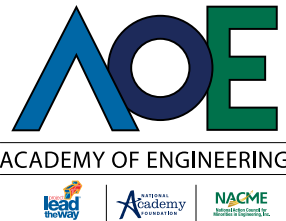


Sprint
In January 2008, the Sprint Foundation, philanthropic arm of Sprint Nextel, pledged \$250,000 over three years to help the Missouri University of Science and Technology (Missouri S&T) train precollege educators to teach the PLTW curriculum.
The funds donated by the Sprint Foundation, which were matched by the Ewing Marion Kauffman Foundation, will be used by Missouri S&T to train teachers from the Kansas City area to administer the PLTW math and science curriculum. As the leading PLTW affiliate in Missouri, Missouri S&T provides teacher training, professional development, and information to administrators and counselors, and also holds the Missouri S&T Summer Training Institute. • www.sprint.com

EDUCATION INITIATIVES



SME-EF Gateway Academies
Since 1979, the Society of Manufacturing Engineers Education Foundation (SME-EF) has been offering scholarships, grants, educational programs, and support to help transform manufacturing education in North American colleges and universities. To attract more women and minorities to engineering fields, SME-EF funded the first STEPS (Science, Technology, and Engineering Preview Summer) program at the University of Wisconsin-Stout in 1997—the same year PLTW was founded.
Today, PLTW partners with SME-EF on the Gateway Academies, coed day camps for middle school students. Gateway Academies offer fun and challenging hands-on, high-tech projects using a curriculum developed by PLTW. The academies were introduced in 2006 to help middle school students explore careers in science, technology, engineering, and mathematics and to encourage them to enroll in the PLTW Gateway To Technology (GTT) curriculum. Approximately 1,000 students participated in Gateway Academies in 2007 and all enrolled in GTT courses that fall. During summer 2008, about 180 academies enrolled an estimated total of 3,600 students. SME-EF’s goal is to add an additional 50 academies per year through 2010. • www.sme.org



Academy of Engineering Collaboration
To help better prepare minority students to pursue opportunities available in STEM fields, PLTW, the National Academy Foundation (NAF), and the National Action Council for Minorities in Engineering (NACME) have partnered to create a network of urban Academies of Engineering. These small learning communities will offer PLTW’s proven project-based engineering curriculum in a unique model developed specifically for urban high schools.
The Academy of Engineering program is scheduled to begin at 13 pilot sites during the 2008–09 school year. Whereas PLTW and NAF will focus on what goes on inside the Academy of Engineering classrooms, NACME will leverage the support of its board members—including the nation’s leading science, technology, and engineering firms—to provide support to academy teachers, students, and parents in activities outside class.
Several leading foundations and corporations are helping support the Academy of Engineering program. The initial plan calls for 110 new Academies of Engineering to be established over the next four years, with the goal of developing a national network of mostly urban academies whose graduates are well prepared for college engineering programs.
www.nae.edu • www.naf.org • www.nacme.org

EDUCATION INITIATIVES (continued)



National Council for Agricultural Education

The National Council for Agricultural Education is adapting PLTW's project-based curriculum model to reinvent agricultural education in the United States. PLTW will consult throughout the process of building a framework for a national core curriculum in agriculture, food sciences, and natural resources. • www.teamaged.org

NASA (Dryden Flight Research Center and Goddard Space Flight Center)

The Dryden Flight Research Center of the National Aeronautics and Space Administration (NASA) and NASA's Goddard Space Flight Center have collaborated with PLTW to develop Aerospace Engineering curricula and fill the STEM pipeline.

The Dryden partnership leveraged the research center's specialized aerospace knowledge and innovation with PLTW's experience and success in writing a curriculum and training teachers for its instruction. The result is a world-class curriculum introducing middle school students to the technology of aeronautics, propulsion, and rocketry, and offering high school students the opportunity to learn about aerodynamics, astronautics, space-life sciences, and systems engineering through hands-on engineering projects and problems.

The Goddard initiative focuses on a middle school and high school cross-disciplinary project designed to infuse STEM content through an exciting "lunar exploration" theme, which includes the opportunity for students to remotely explore a lunar surface. Participating schools are required to send a team composed of a PLTW teacher, a math teacher, and a science teacher to a weeklong summer training session. • www.nasa.gov/centers/Dryden • www.nasa.gov/centers/Goddard

Engineering Equity Extension Service (EEES)

PLTW and the National Alliance for Partnerships in Equity (NAPE) Education Foundation are working collaboratively with the Engineering Equity Extension Service (EEES) offered by the National Academy of Engineering to identify and train a cadre of master teachers who will train others to integrate gender equity principles into the PLTW Summer Training Institutes. The goal of this collaboration is to increase the participation of girls in PLTW programs across the country.

To accomplish this mission, the team is focusing on three priority areas: providing professional development on equity in engineering education to master teachers and affiliate professors; designing and implementing an "Equity in Engineering" professional development workshop for guidance counselors; and recommending changes to the PLTW curriculum to incorporate equity in instruction and offer resources and student-based activities that will appeal to a more diverse student population. • www.napequity.org/EEES.htm

FOUNDATIONS

Kern Family Foundation

The Waukesha, Wisconsin-based Kern Family Foundation is committed to its mission of preparing students for the challenges of the 21st century through values, education, and innovation. In its five-year history of supporting K-12 STEM initiatives, the Foundation has invested \$10 million in grant awards. These awards have primarily gone to more than 300 schools in Wisconsin, Iowa, Illinois, and Minnesota as start-up support for their implementation of PLTW. • www.kffdn.org

Ewing Marion Kauffman Foundation

The financial support of the Kauffman Foundation has been vital in the growth of PLTW in the Kansas City area. Thanks, in part, to matching grants from the foundation totaling \$1.2 million, 16 high schools and two middle schools in the Kansas City area have implemented the PLTW curriculum, and plans are under way to increase this number to more than 35 high schools and at least 10 middle schools over the next four years. The foundation also supports STEPS Camps and Gateway Academies in Missouri and Kansas in partnership with SME-EF. • www.kauffman.org

Southern Regional Education Board

Founded in 1948, the Southern Regional Education Board (SREB) is a nonprofit, nonpartisan organization that works with leaders and policymakers in 16 member states to improve pre-K through postsecondary education. The SREB's High Schools That Work (HSTW), the largest school improvement initiative in the country, began in 1987 and is now in 1,300 schools throughout the country, many of which also use PLTW curricula. • www.sreb.org

ASSOCIATION ENDORSEMENTS

The rigorous and relevant PLTW curriculum has been officially endorsed by several national associations, including:

■ Aerospace Industries Association • www.aia-aerospace.org

■ National Association of Manufacturers and the Manufacturing Institute • www.nam.org

■ National Defense Industrial Association • www.ndia.org

■ National Fluid Power Association • www.nfpa.com

PLTW's partner associations offer career guidance and scholarships for students, technical support, and additional resources.

MEMBERS

■ Center for the Advancement of Scholarship on Engineering Education (CASEE) • www.nae.edu/casee

■ National Alliance for Partnerships in Equity (NAPE) • www.napequity.org

GOVERNMENT RELATIONS

Washington Partners, LLC

While PLTW was growing in Washington, D.C., were discussing an impending national crisis—the diminishing prominence of the United States in innovation and research, the lack of interest among young people in the pursuit of STEM disciplines, and the overall disappointing quality of U.S. high school graduates. Executives at PLTW knew their efforts could inform, and benefit from, national initiatives, and they sought a Washington, D.C., partner. Washington Partners, LLC (WP LLC), is a government relations firm known for its expertise in education policy. WP LLC facilitates connections with like-minded agencies and organizations in Washington, D.C., shares the program's progress and results with stakeholders and lawmakers, and identifies links between federal policy and PLTW efforts and objectives. • www.wp LLC.net

MARKETING AND COMMUNICATIONS

A3 Creative Group

A3 Creative Group is one of the nation's leading experts in education communications and is PLTW's exclusive communications provider. A3's work for PLTW includes producing all booklets, brochures, and publications, such as the Model Schools Yearbook, *PLTW in Action*, and the quarterly community newsletter, *Sharp Edge 3.0*. A3 also oversees all electronic communications projects, such as creating a new DVD and an improved website. Going forward, A3 will play an instrumental part in continuing to expand the engineering network, building the Biomedical Sciences Program network, and developing partnerships that unite nonprofit and for-profit organizations. • www.a3creativegroup.com

High-Engagement Philanthropy

THE PLTW DIFFERENCE

Project Lead The Way® (PLTW) has succeeded because it is a model based on accountability. PLTW, along with every district, school, educator, and student in the PLTW network, is expected to meet the highest performance standards and is held accountable for the results.

This performance-centered strategy is championed by the Charitable Leadership Foundation (CLF), founded by the family of Richard Liebich, chairman of the board and chief executive officer for PLTW. CLF promotes “high-engagement philanthropy” to effect change in the areas of education, housing, and health care for low-income populations. Essentially, CLF believes that the key to success and the best way to achieve permanent, positive social change is improving the performance of the organizations and projects it funds.

Tasha Giles of Jefferson/Whittier Middle School in Pontiac, Michigan.

As CEO of the related Charitable Venture Foundation (CVF), Liebich fosters responsible entrepreneurship to address social and education issues. Under Liebich’s direction, PLTW secured an initial grant from CVF in the early 1990s to develop its fledgling high school engineering curriculum. PLTW’s mission, “to create dynamic partnerships with our nation’s schools to prepare an increasing and more diverse group of students to be successful in science, engineering, and engineering technology,” was solidly in line with CVF’s vision.

Thanks to this initial grant and ongoing funding from CLF and other donor organizations, PLTW grew to become an independent not-for-profit organization in 1997. That year, PLTW launched the Pathway To Engineering curriculum at 12 high schools in upstate New York. In 1998, PLTW became a national program with the addition of two New Hampshire schools.

THE HIGH-ENGAGEMENT PHILANTHROPY ADVANTAGE

High-engagement philanthropy demands a tremendous investment from both the “funder”—the foundation granting the funds—and the “grantee,” or organization on the receiving end. While the funder delivers financial and strategic support, the grantee is required to meet certain performance goals and standards. This partnership approach to grant funding adds accountability to the philanthropy equation, which translates into a greater likelihood of success.

RECOGNIZING EXCELLENCE: PLTW AWARDS AND ACHIEVEMENTS

As PLTW has grown, so has the national recognition for its efforts and results. Here’s a sampling of some of the most recent awards and achievements earned by PLTW and its leadership team.

Bayer Foundation Best Practice

The Bayer Foundation recognized PLTW as a K–12 Best Practice STEM Education Program in 2006 for “bridging the diversity gap in science and engineering education.” The foundation chose to spotlight PLTW on the basis of four criteria: challenging content/curriculum, an inquiry learning environment, defined outcomes/assessment, and sustained commitment/community support.

Social Entrepreneurship Award

In 2006, PLTW CEO Richard Liebich received the Manhattan Institute’s prestigious Social Entrepreneurship Award. The award recognizes nonprofit leaders who have created innovative solutions—with little or no financial aid from the government—for some of the nation’s most prevalent social problems. Liebich was chosen for developing a program that “fosters greater economic choice and economic responsibility.”

SME Education Award

The Society of Manufacturing Engineers granted PLTW its 2007 SME Education Award, “for development of manufacturing-related curricula, fostering sound training methods, and inspiring students to enter the profession of manufacturing.” PLTW was noted for uniting public schools, higher educational institutions, and the private sector to increase the quantity and quality of engineers and engineering technologists graduating from the United States school system. The award is one of the SME’s Engineers’ International Honor Awards, which annually recognize significant contributions to the field of manufacturing engineering in the areas of manufacturing technologies, processes, technical writing, education, research, management, and service to the Society.

Students gather around a computer in a Digital Electronics class at Del Rio High School in Del Rio, Texas.

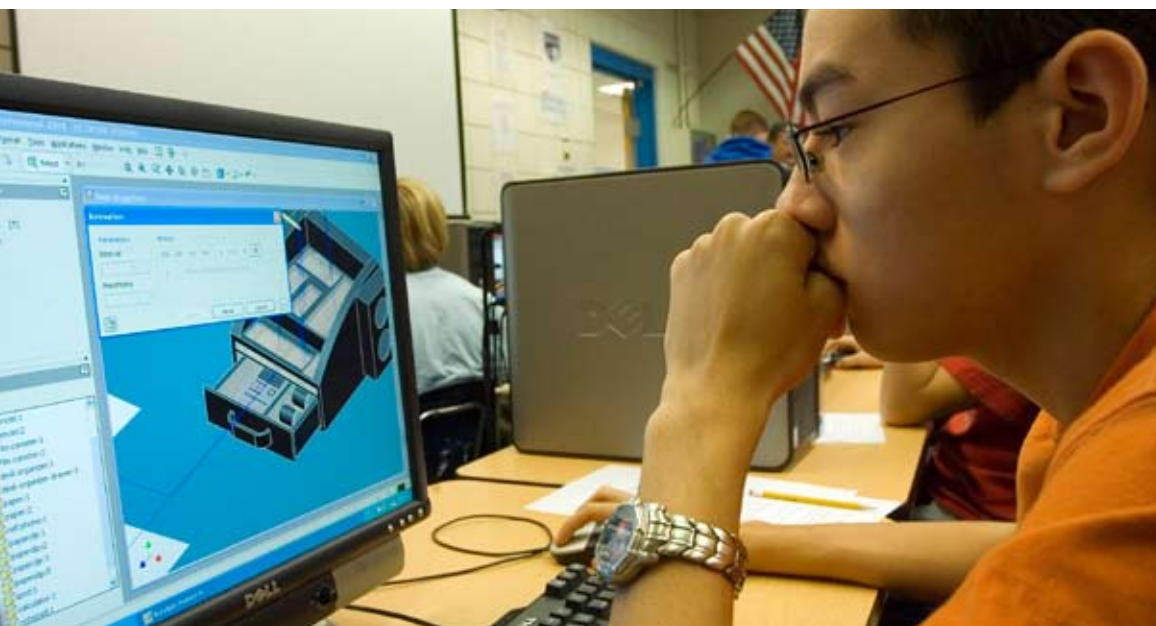
PLTW’S HISTORY

Richard Blais, now vice president of PLTW, first developed the idea of a pre-engineering curriculum in the 1980s, when he was chairman of the technology department at Shenendehowa Central School in Clifton Park, New York. Blais, who began his career as a secondary school teacher and who has also worked as an engineer, recognized the need to build a homegrown talent pool to meet the increasing demand for engineering professionals in the United States.

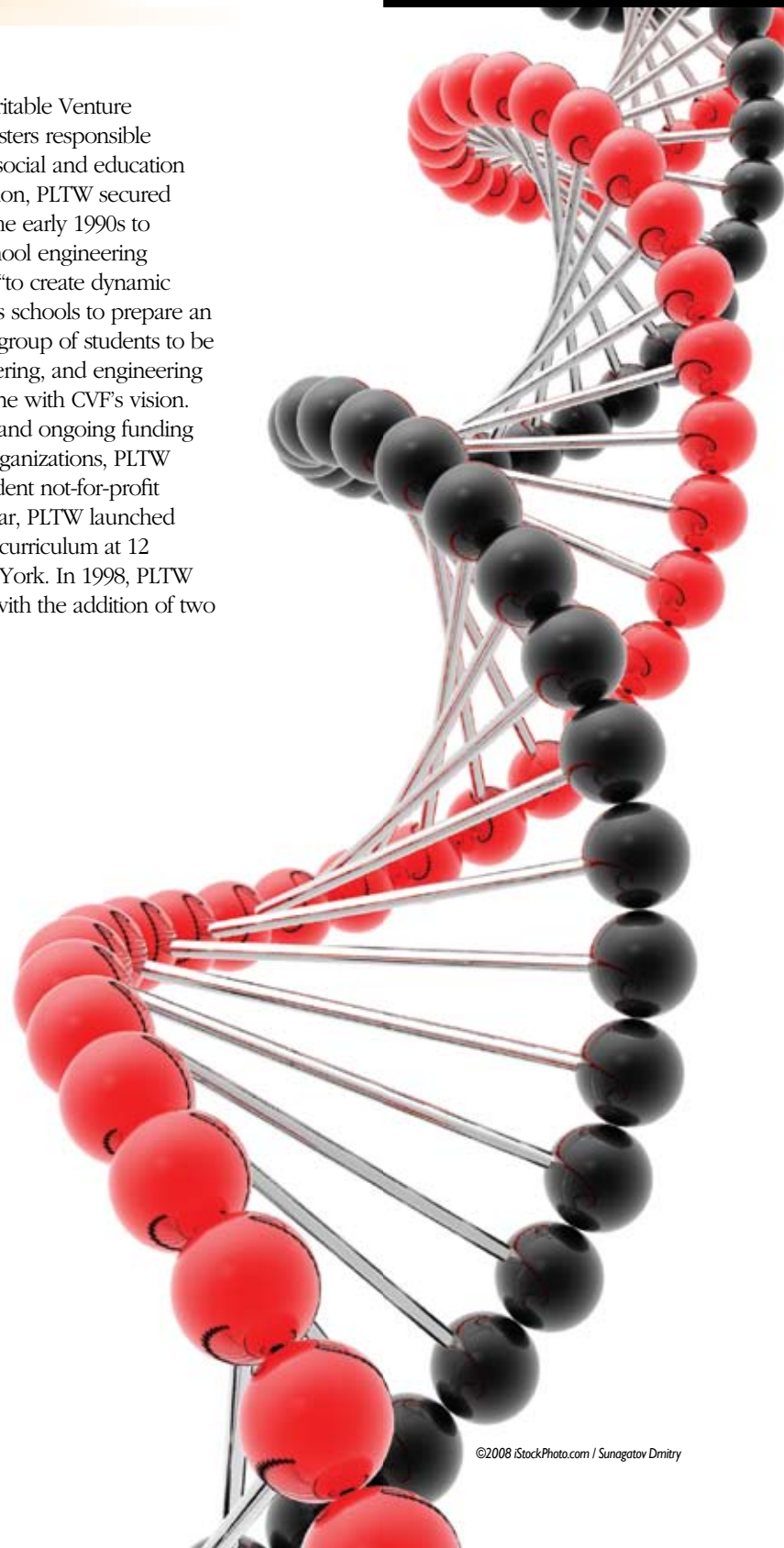
Working with the New York State Education Department and Hudson Valley Community College, Blais and his staff began a process of reviewing, developing, and testing a series of courses that incorporated the skills needed in engineering with the latest high-technology equipment and software. To garner support from leaders in education and industry, Blais established a technology advisory board.

The first postsecondary PLTW partner was the Rochester Institute of Technology, which became the program’s first national affiliate and hosted the first professional development Summer Training Institute for teachers.

Zach Stanley and **Paige Beighle** mix it up at Francis Tuttle Biosciences and Medicine Academy in Oklahoma City, Oklahoma.



Marcus Roman studies a drawing on his computer screen during a freshman-level engineering class at East Lake High School, Tarpon Springs, Florida.



How PLTW Can Work for You

THE PLTW DIFFERENCE



Justin Choe in the lab at the Francis Tuttle Biosciences and Medicine Academy in Oklahoma City, Oklahoma.

Below: **Eric Rieman** works on an Elenco digital/analog trainer in his class at Miller City High School in Miller City, Ohio.



Individuals, businesses, associations, and state and local governments nationwide believe in the power of Project Lead The Way® (PLTW) to transform STEM education in the United States.

In every state and the District of Columbia, PLTW partners are providing the financial and in-kind support required to develop rigorous curricula, equip teachers with professional development materials and hands-on experience, and offer students relevant, real-world feedback on proposals, projects, and designs.

A wide variety of PLTW partnership opportunities are available. Take a look at some of the ways you or your organization can get involved:

- Join a local PLTW partnership team—Each school in the PLTW network has a partnership team composed of mentors, coaches, or advisors from business and industry, colleges, and the community. The team meets several times a year and assists PLTW teachers in numerous ways, including helping to solve operational problems with the curriculum.
- Provide internships, job shadowing experiences, part-time or summer employment, or scholarships to PLTW students and teachers. Offering on-the-job opportunities to qualified and motivated PLTW students helps companies grow their own future workforce.
- Offer incentives for employees in STEM-related fields to serve as mentors and coaches for local PLTW middle school and high school programs.
- Partner with schools to purchase the equipment and supplies needed to support implementation of the PLTW curriculum. (The complete equipment list is available on the PLTW website, www.pltw.org.)
- Sponsor information meetings for local education and community leaders to promote awareness of PLTW and its efforts to reshape STEM education in the United States.



Shanee Watson, a graduate of the Francis Tuttle Pre-Engineering Academy in Oklahoma City, Oklahoma, is a full-scholarship engineering major at Boston's Massachusetts Institute of Technology.

Investing in Educators: The PLTW Professional Development and Support System

Forging the Innovation Generation would be impossible without qualified and motivated teachers. PLTW makes a tremendous investment in work-class professional development to ensure the success of its network. In addition, PLTW teachers can access ongoing peer and technical support at the local, state, regional, and national levels.

Before a teacher can be a PLTW instructor, he or she is required to attend an intensive, two-week PLTW Summer Training Institute. During these sessions, teachers experience the PLTW classes as their own students will, which gives them invaluable insights into how to make the courses as engaging as possible during the school year.

Registered PLTW teachers also have access to the Virtual Academy for Professional Development, which offers on-demand multimedia lessons and a subscription e-mail service for support and innovation that reaches a national network of PLTW educators.

Nationwide Support and Information Network

PLTW partner schools, teachers, and school counselors are part of a nationwide support and information network. This network includes PLTW state leaders, PLTW master teachers, and the PLTW national staff, who are all available to lend support and answer questions via e-mail or phone.

There is also a special PLTW professional development program and network for school counselors, including an annual statewide awareness conference and counselor's kit. The kit features a PLTW resource guide, promotional posters, handouts, and other helpful resource materials.



From left: **Hannah Warren**, **Shyette Edwards**, and **Corey Walton**, PLTW students at Thornton Township High School in Harvey, Illinois.

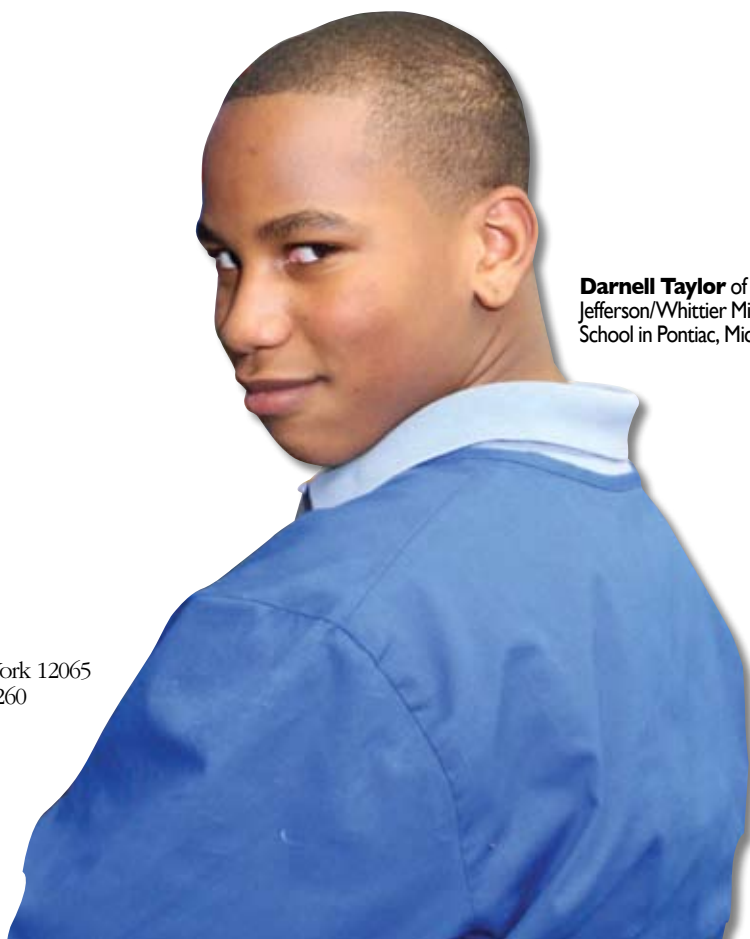




Want to learn more?

Find out what you can do to help forge the Innovation Generation.

Visit www.pltw.org or call 518-877-6491.



Darnell Taylor of
Jefferson/Whittier Middle
School in Pontiac, Michigan.

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